Draft

Phase 2 Focused Remedial Investigation/ Feasibility Study Contractor Quality Control Plan

for the

Diamond Head Oil Superfund Site
Kearny, New Jersey

Prepared for:
U.S. Environmental Protection Agency
Region II
290 Broadway, New York

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Final Contractor Quality Control Plan
for Focused Remedial Investigation/Feasibility Study

Diamond Head Oil Superfund Site
Kearny, NJ
USACE Contract No. DACA87-02-D-0006
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Approved:

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Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
ASTs	Above Ground Storage Tanks
CQCM	Contractor Quality Control Manager
CQCP	Contractor Quality Control Plan
ER	Engineering Regulation
FFS	Focused Feasibility Study
FS	Feasibility Study
HSP	Health and Safety Plan
IRM	Interim Remedial Measure
LIF	Laser Induced Fluorescence
LNAPL	Light Non Aqueous Phase Liquid
NCRs	Nonconformance Reports
NJDEP	New Jersey Department of Environmental Protection
P.E.	Professional Engineer
P.G.	Professional Geologist
PM	Project Manager
PRG	Preliminary Remediation Goals
QA	Quality Assurance
QAC	Quality Assurance Coordinator
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCT	Quality Control Team
QMP	Quality Management Plan
QP	Quality Procedure
RAO	Remedial Action Objectives
RI	Remedial Investigation
RPM	Regional Project Manager
RTL	Review Team Lead
SAP	Sampling and Analysis Plan
SMP	Site Management Plan
SOP	Standard Operating Procedures

TM-1	Technical Memorandum 1
TM-2	Technical Memorandum 2
TRC	Technical Review Committee
UFP	Unified Federal Policy
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1. Introduction

CH2M HILL has been retained by the United States Environmental Protection Agency Region 2 (USEPA 2) through the U.S. Army Corps of Engineers, Kansas City District (USACE) to perform a focused remedial investigation (RI) and feasibility study (FS) at the Diamond Head Oil Superfund Site (Site) located in Kearny, NJ (Hudson County). This Contractor Quality Control Plan (CQCP) has been developed to establish the processes for quality performance throughout the RI/FS project including all end products/deliverables. Accordingly, the goals of this CQCP are:

- Identify end products/deliverables.
- Identify each critical stage of development for which the quality must be controlled in order to create the required end products.
- Define the acceptability criteria for each process, procedure and product.
- Define the methods and personnel to be used in determining if the acceptability criteria have been satisfied.
- Identify each member of the quality control team and their defined roles.
- Establish corrective action processes when the acceptability criteria have not been met.
- Provide documentation that quality control has been accomplished.

2. Project Description

CH2M HILL is performing a Phase 2 focused remedial investigation in conjunction with a focused feasibility study at the Diamond Head Oil Superfund Site (Site) in Kearny, New Jersey. The Site is a former oil reprocessing facility, which was in operation until early 1979. During facility operations, multiple aboveground storage tanks (ASTs) and underground pits were used to store oily wastes. These wastes were intermittently discharged directly to adjacent properties to the east and the wetland area on the south side of the site, creating an oil lake covering an estimated 5 acres. The oil lake was subsequently filled but a light non aqueous phase liquid (LNAPL) is currently present on top of the groundwater table in that area. Wastes, believed to be construction-related, were also disposed of in a landfill currently covering an estimated 7 acres. Contaminants identified at the site during previous investigations include volatile organics, semi-volatile organics, pesticides, PCBs and metals.

The general objectives of the Phase 2 focused RI activities are to investigate the LNAPL source area and the composition of the former landfill. The data collected from this focused investigation will support a focused feasibility study which will evaluate appropriate alternatives for the interim remedial measure (IRM) for the LNAPL found at the site. Further details regarding the (project objectives) scope of work, and product milestones are presented in the Work Plan and are also provided in the following sections.

2.1 Project Objectives

The overall objectives of the focused Phase 2 RI and FS activities are as follows:

- Delineate and assess the mobility of the LNAPL observed during the Phase 1 RI in the former lagoon area and in the former refinery area. The investigation will include applying laser induced fluorescence (LIF) technology to delineate the extent of the LNAPL. Soil samples will be collected to evaluate the LNAPL in terms of potential mobility/recoverability and its leachability of contaminants to groundwater.
- Confirm that, as suggested by the Phase 1 groundwater sampling results, the landfill (believed to contain construction debris based on historic information) does not constitute a source of groundwater contamination. This investigation will include a visual inspection of landfill material along with chemical analyses of soil samples removed from trenches excavated during the RI activities.
- Collect information to support a focused feasibility study of remedial technologies for LNAPL. This includes performing pilot testing to support evaluation of the remedial technologies which appear to be applicable to the current site conditions.
- Prepare a Technical Memorandum presenting the results of the focused Phase 2 RI.

- Present a Focused Feasibility Study Report that will support the USEPA 2's selection of an IRM to remediate the on site LNAPL.

The detailed technical approach for meeting these general objectives is described in the Work Plan. The documents describing the specific procedures that will be used and presenting the results of the conducted activities are described in the next section.

2.2 Project Scope of Work

The following tasks will be performed by CH2M HILL during this project:

- Development of site specific project plans including a Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP), a Technical Memorandum describing preliminary remedial technologies, and this Contractor Quality Control Plan (CQCP).
- Revisions to the existing Phase 1 Sampling and Analysis Plan (SAP), Health and Safety Plan (HSP), and Site Management Plan (SMP) to include the Phase 2 RI/FS activities.
- Completing the RI field investigations described in the Work Plan and following the procedures in the project plans.
- Reporting of focused RI results and conclusions in Technical Memorandum 2.
- Preparation of a Focused Feasibility Study Report.

Details pertaining to the aforementioned tasks are presented in the subsections below:

2.2.1 Uniform Federal Policy – Quality Assurance Project Plan

A QAPP following the UFP-QAPP manual will be developed for the project which will describe policy, organization, functional activities, and quality assurance and quality control (QA/QC) protocols necessary to achieve the data quality objectives established for the Phase 2 RI/FS.

2.2.2 Technical Memorandum 1

Technical Memorandum 1 (TM-1) will be developed to identify a preliminary list of remedial technologies applicable to the LNAPL contamination at the site. The remedial technologies will be undergo preliminary screening in terms of effectiveness, implementability, and relative cost. TM-1 will be prepared prior to field mobilization and will provide the basis for the recommended Phase 2 pilot testing.

2.2.3 Contractor Quality Control Plan

This CQCP, in conjunction with the SAP, will provide CH2M HILL's process for delivering quality work end products while maintaining quality performance throughout the project. The CQCP will identify each project end product and demonstrate the procedures which will ensure that acceptability criteria have been achieved at each critical stage.

2.2.4 Sampling and Analysis Plan

The applicable sections from the Sampling and Analysis Plan used during the Phase 1 RI will be revised and updated to reflect the full scope of the Phase 2 activities. Site-specific field sampling requirements, outlined in the Work Plan, will be detailed in SAP Section 4. Existing Standard Operating Procedures (SOPs) will be revised and new SOPs developed as needed. The UFP-QAPP, used in conjunction with the SAP, will present the project's QA/QC requirements for chemical analysis of samples obtained during the field sampling activities.

2.2.5 Health and Safety Plan

Revisions to the Phase 1 HSP will be made to include the additional Phase 2 RI tasks. The revisions are needed in order to include new potential risks and methods of prevention specifically associated with the Phase 2 RI tasks. The HSP will also be updated with the most current exposure concentrations obtained from Phase 1 analytical results.

2.2.6 Site Management Plan

The existing Phase 1 SMP will be revised to reflect Phase 2 activities. The plan will describe management responsibilities, contact information, and onsite management procedures and planned field facilities and locations.

2.2.7 Field Investigation Activities

CH2M HILL and its subcontractors will perform the Phase 2 activities described in the Work Plan. These will consist of site preparation activities, landfill investigation, LNAPL investigation, and pilot testing.

2.2.8 Technical Memorandum 2

Technical Memorandum 2 (TM-2) will be prepared following the completion of all RI field activities including demobilization of field equipment. TM-2 will present the results of the Phase 2 investigation activities. Preparation of the Focused Feasibility Study report will begin upon completion of TM-2.

2.2.9 Focused Feasibility Study

This task includes preparation of a Focused Feasibility Study Report detailing results of the feasibility evaluation of alternatives for the remediation of the LNAPL found at the site.

2.3 Product Milestones

Major product milestones are identified on Figure 2-1. A more detailed schedule will be developed prior to field mobilization based on input from subcontractors and equipment vendors. The detailed schedule will be provided to the USEPA 2, USACE, and project staff to allow all parties sufficient time for project planning activities.

3. Organization and Responsibilities

The organization and responsibilities of the product development and quality control team are outlined in the following subsections. The organization of the team has been established in order to provide clear lines of functional and project responsibility. In addition, a defined management control structure is in place for this project. The control structure involves the USEPA 2 Project Manager (PM), USACE PM, and the CH2M HILL PM. Details of CH2M HILL's Project Delivery Team and Quality Control Team, are presented below.

3.1 Project Delivery Team

CH2M HILL will assemble a team of engineers and scientists to complete the Phase 2 scope. A list of core project team members, disciplines, and assigned roles is presented in Table 3-1.

3.2 Quality Control Team

The members and responsibilities of the Quality Control Team (QCT) are described in the following sections. This team will proceed under the direction of the Contractor Quality Control Manager (CQCM)/Review Team Lead (RTL) and follow the quality control procedures outlined in this CQCP. The CQCM/RTL is responsible for implementation of the CQCP by all members of the QCT to ensure high quality is achieved and maintained throughout the project. The QCT will review product deliverables explicit to their discipline and project role as described in the following subsections. Recommendations and the approval or disapproval of all final products will be made by the appropriate quality control team member to ensure utilization of each member's technical expertise. Table 3-2 summarizes the responsibilities of the QCT.

3.2.1 Contractor Quality Control Manager/Review Team Lead

The CQCM RTL is responsible for overall implementation and executions of this QCP by all quality control team members. The CQCM/RTL will ensure that all activities undertaken on this project undergo the appropriate quality control measures as described in the CQCP. Mr. Mark Lucas will be the CQCM/RTL for this project. Mr. Lucas served as the RTL during the Phase 1 activities and has project management and technical experience with USEPA 2 work assignments.

3.2.2 Project Manager

Juliana Hess will serve as the CH2M HILL Project Manager during the Phase 2 RI/FS. Ms. Hess will review all draft and final end products prior to delivery to the USEPA 2 and USACE to confirm that all end products meet CH2M HILL's quality standard and that the project objectives have been achieved and accurately documented.

3.2.3 Quality Control Inspectors

Quality Control Inspectors are responsible for implementation of quality performance during each activity pertaining to their respective discipline and role as defined in Table 3-2 of this CQCP. The QC Inspectors will oversee their respective activities to ensure that requirements of this QCP, along with the SAP, UFP-QAPP, and other project planning documents, are being met. Mr. Andy Judd and Mr. Matt Germon will serve as Task Leads/Quality Control Inspectors.

3.2.4 Project Chemist

The project chemist will provide oversight of preplanning and field implementation of the sampling and analysis activities for the Phase 2 RI/FS. The project Chemist, Ms. Heather Hoddach, is also responsible for the UFP-QAPP and subcontractor laboratory SOPs, qualifications and QA plans. During the RI/FS field activities, Ms. Hoddach will oversee review and validation activities for the analytical data. The project chemist will perform audits of subcontract laboratories, if required.

3.2.5 Quality Assurance Manager/Senior Technical Support

Senior technical support and quality assurance will be provided by Mr. Tom Palaia (LNAPL delineation and remedial alternatives), Mr. Mark Lucas (RI activities, geology and hydrogeology), and Mr. Kevin Flynn (construction). They will also conduct technical reviews of all end products including the planning documents and activities, field activity milestones, and technical memorandums and reports created following the field activities. The Quality Assurance Managers/Senior Technical Support Leads will utilize their specialized knowledge to efficiently focus on all aspects of technical system designs, analytical and field data, and results and conclusions derived during the formation of each end product. They will not be involved in the day-to-day development of these products; however, may be consulted during the planning and development of the product when requested by the project team. Technical reviews will be conducted at the critical stages of development, during appropriate project milestones, during data interpretation, and of each end product to ensure the products meet the acceptability criteria presented in Section 6.0

4. End Products/Project Deliverables

End products, and their respective product objectives, are presented in the sections below.

4.1 Uniform Federal Policy – Quality Assurance Project Plan

The objectives of the UFP-QAPP are to:

- Follow the explicit procedures and examples provided within the Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) Manual to develop the project QAPP.
- Detail project specific policy, organization, functional activities, and QA/QC protocols necessary to achieve the established data quality objectives.

4.2 Technical Memorandum 1

The objectives of the technology screening Technical Memorandum 1 are to:

- Identify preliminary remedial technologies applicable to the LNAPL.
- Evaluate technologies based on their effectiveness, implementability, and relative cost.
- Identify Applicable or Relevant and Appropriate Requirements (ARARs), preliminary remediation goals (PRGs), remedial action objectives (RAOs), and general response actions.
- Produce this report prior to the start of the Phase 2 field activities to determine whether any additional pilot testing would be appropriate.

4.3 Contractor Quality Control Plan

The objectives of the CQCP are as follows:

- Describe CH2M HILL's processes for quality control such that quality performance is maintained throughout the project.
- Describe the QC organization and demonstrate how documentation and investigation activities are monitored for compliance and quality end products.

4.4 Sampling and Analysis Plan

The objectives of the Phase 2 Sampling and Analysis Plan are to describe the Phase 2 activities to be conducted at the site and provide the field team with the necessary SOPs. To that effect, the existing Phase 1 Sampling and Analysis Plan will be revised to reflect the Phase 2 activities described in the Work Plan. The revisions will be made to Section 4 of the Phase 1 SAP where the overall objectives and scope of the Phase 2 activities will be presented. In addition, SOPs in need of update will be revised (e.g., the SOP on bottling requirements will be revised to reflect the latest bottling requirements) and new SOPs will be developed (e.g., LIF) to provide detailed instructions for new activities.

4.5 Health and Safety Plan

The objectives of the revised HSP are to:

- Present the health and safety considerations specific to the Phase 2 activities. To that effect, the existing Phase 1 Health and Safety Plan (HSP) will be revised to include these considerations as well as contaminant exposure concentrations that are expected to be encountered at the site based on data obtained during Phase 1.
- Establish health and safety procedures and action levels for each of the activities to be performed at the site during the Phase 2 RI.

4.6 Site Management Plan

The objectives of the SMP are to:

- Describe the facilities and onsite operations during the Phase 2 activities. To that effect, the existing Phase 1 SMP will be revised to include new information.
- Describe management roles and responsibilities, project contact information, and means of communication.
- Detail site specific access and security procedures, facilities and services, contingency procedures, storage of generated wastes, and field activities tracking and communications systems.

4.7 Phase 2 Focused Investigation Field Activities

The objectives for the Phase 2 field investigation activities are presented in the Work Plan. The detailed procedures that will be employed by the project team are detailed in the UFP-QAPP, SAP, SMP, H&S Plans and CQCP. The project team will follow these procedures and deviations will be approved and documented before they are implemented.

4.8 Technical Memorandum 2

The objective of Technical Memorandum 2 is to present the results and conclusions of the Phase 2 investigation activities and serve as the basis for the evaluation of remedial alternatives as well as for defining data gaps for subsequent investigations that may be conducted at the site for overall site characterization and remediation.

4.9 Focused Feasibility Study Report

The objectives of the Focused Feasibility Study Report are to:

- Identify ARARs, PRGs, RAOs, target areas for remediation, and general response actions.
- Develop, screen, and evaluate alternatives, including development of order of magnitude estimates of costs that can be used by USEPA 2 in selecting an interim remedial measure for the LNAPL found at the site.

5. Critical Stages for Control of Quality

Compliance with quality control requirements will be verified at each critical stage based on the milestone identified in Section 2.3. The end products/deliverables milestones listed in Section 2.1 can be divided into three categories: pre RI planning, execution of the RI field activities, and remedial investigation and FFS reporting activities.

The documents developed prior to RI field activities include a UFP-QAPP, TM-1, this CQCP, and revisions to the SAP, HSP, and SMP. Field activities will begin following USEPA2 approval of these planning documents. Upon completion of the RI field activities, a TM-2 will be prepared to document the results of the conducted investigations followed by the FFS which will evaluate appropriate remedial alternatives.

5.1 Control of End product/Deliverable Preparation

Quality control procedures at each critical stage of document development include:

- A draft of each document will be prepared in accordance to task order DH-02, dated June 12, 2007.
- Before beginning work on a document, the Contractor Quality Control Manager/Review Team Lead will lead a discussion, as appropriate, between the project manager, the Quality Assurance Managers/Senior Technical Support staff, the Task Leads/Quality Control Inspectors, and the project team to discuss the outline, scope, information, data analysis, and presentation to be included in each end product/deliverable. The objective of this discussion is to obtain input and guidance from the senior staff supporting the project and streamline the deliverable development and review process.
- Before beginning development of the draft deliverable, the outline resulting from the above discussion will be provided to USEPA 2 for review in order to ensure that the outline meets USEPA 2's needs for the report's contents.
- Internal product checks and interdisciplinary checks will be performed throughout document development.
- Following completion of a draft version, document reviews will be performed by the appropriate Task Lead/Quality Control Inspector followed by review by the appropriate Quality Assurance Manager/Senior Technical Support person (Table 3-2).
- Reviews will be coordinated by the Contractor Quality Control Manager/Review Team Lead. The project manager will also review all deliverables.
- The Contractor Quality Control Manager/Review Team Lead will then lead a discussion, as appropriate, between the project manager, the Quality Assurance Managers/Senior Technical Support staff, the Task Leads/Quality Control

Inspectors, and the project team to discus and resolve comments. A certification of comment resolution will be included with each document (Section 5.1.4).

- Revisions to the draft document will incorporate applicable comments or changes resulting from the review described above. All applicable comments will be accepted or denied by the author based on the accuracy and validity of the comments. Section 6.0 details the acceptance criteria. Additional accepted scientific/engineering principles, historical data accuracy, and other considerations will be utilized in the determining the acceptability of comments.
- Once each appropriate QCT member has reviewed the draft document, a final review of the document for format, grammar, and spelling will be completed.
- Three hardcopies of the draft will be produced and issued to the USEPA 2 for review. One copy of all documents will also be submitted to the USACE for their files.
- Following USEPA 2 review, all comments will be addressed and changes will be incorporated into each document.
- Before beginning to revise the documents, the project team will identify comments in need of clarification and will contact USEPA 2 for this clarification. Following these discussions, the project team will prepare a letter for USEPA 2's review summarizing how each comment will be addressed. Revisions to the document will commence after USEPA 2's approval of the plan for addressing comments.
- Revisions to the document will follow the relevant parts of the process for preparing the draft document.
- Upon completing the final revisions, three copies of the final document will be submitted to the USEPA 2 and one copy will be submitted to the USACE.

5.2 Product Checks

Product checks regarding calculations, data accuracy, and the validity of information will be performed by the product development team during the document preparation process. Qualified individuals will focus on each appropriate section of each document dependant on their specialized discipline (Table 3-2). Each qualified individual will be selected and overseen by the Contractor Quality Control Manager/Review Team Lead. The product development team is responsible for coordination of checks and to ensure that a qualified checker has reviewed the document. Each checker will be selected in regards to their expertise, experience level and the task complexity and risk. Checks for all documents will include:

- Appropriate level of quality performance
- Data validity
- Accuracy and correctness of calculations
- Completeness of documentation

5.2.1 Interdisciplinary Checks

Interdisciplinary checks will be conducted between the development workers and the Task Leads/Quality Control Inspectors throughout the product development process. The interdisciplinary checks will ensure the proper quality controls are followed for each task along with preventing conflicts between other portions of the project developed by another discipline. Each Task Lead/Quality Control Inspector and product development team member will be able to review the total scope of the product for overall quality performance.

5.2.2 Technical Reviews

Technical reviews will be completed and documented for each end product as noted in Section 5.1. Staff with specialized technical, managerial, or specific task experience will review the applicable portions of the product. Following the review by the Task Lead/Quality Control Inspector, a review of the document will be conducted by the appropriate Quality Assurance Managers/Senior Support staff.

5.2.3 Certification

The attachment to this plan contains the forms which will be signed to document the quality control process. The completed forms will be maintained in the project files.

5.3 Control of Field Activities

The Task Lead/Quality Control Inspectors will oversee the field personnel conducting the Phase 2 activities to ensure that the acceptability and quality performance criteria are met. Prior to the initiation of the RI field activities, the Task Lead/Quality Control Inspectors will inspect the site to ensure that the required planning activities have been completed and the appropriate materials and equipment for the field activities are in place. During their routine visits to the site, the Task Lead/Quality Control Inspectors will spot review field documentation completed to document field activities. Feedback will be provided to the field team on the completeness and accuracy of the documentation. If required by the Task Lead/Quality Control Inspector, field documentation will be returned to the originator for correction or completion. Two field audits will be performed to examine or review field documentation or other relevant information to ensure its completeness and accuracy.

6. Acceptability Criteria

6.1 Field Activities Criteria

Acceptability criteria for the field and analytical activities are presented in all the planning documents. These contain the quality objectives for each activity, the standards that must be achieved, acceptability/performance criteria, applicable documentation, QC activities and frequencies, and persons responsible for development of the required QC documentation. A summary of the field activities criteria is provided below and detailed in Table 6-1.

Field activity
General quality objective will be as defined in the Work Plan (for example, construct temporary roadways which can support field activities during this and future investigations).

Standards
The standards that will be followed are specified in all the planning documents (for example, the road construction SOP specifies the road construction widths, thickness, materials to be used, etc).

Acceptability/Performance Criteria
The field activity will be deemed to be acceptable only if performed in accordance with the applicable standards (e.g., the procedures in the SOP). In some cases, all standards may not be attained. For example, test pitting in the landfill targets a depth of 10 feet. However, due to the nature of the landfilled materials and slope stability considerations, this depth may not be achieved. In all such cases, documentation will be maintained in the field log book as to the reasons why the desired performance criteria could not be achieved.

Applicable quality documentation
Complete the forms identified for the activity in the planning documents (for example, the forms in the road construction SOP). The frequency will be as specified in the planning documents (for example, per the SOP, measurements will be taken at the specified frequencies along the length of the roadways).

Responsible Person
FTL is responsible for completing the required documentation and the Task Leads/QC Inspectors are responsible for spot checking its completeness and accuracy and providing feedback to the FTL and the field team.

Quality Control Activity/Frequency
The Task Leads/Quality Control Inspectors will perform an initial review of site activities followed by two inspections during the implementation of field activities.

6.2 Deliverables Criteria

The primary guidance that will be used for the development of the desired end products/deliverables is the Task Order Scope of Work for the Diamond Head Oil Superfund Site, Kearny, New Jersey, dated June 2007. Other product criteria will be obtained from applicable published USEPA 2 guidance documents. It is difficult to define acceptability criteria for deliverables because of the sometimes, subjective nature of the assessments in the technical evaluations presented in documents. As specific criteria are not readily available, it is important for the project team to closely follow, monitor, and document the process for controlling the quality of deliverables described in this CQCP.

6.3 Regulatory Criteria

Documents will be prepared and field activities conducted in accordance with applicable state and federal regulations. A listing of these regulations is presented below.

	Code of Federal Regulations
29 CFR 1910 and 1926	Occupational Safety and Health Standards
40 CFR 61	National Emissions Standards for Hazardous Air Pollutants
40 CFR 257	Criteria for Classification of Solid Waste
40 CFR 260	Hazardous Waste Management Systems: General
40 CFR 261	Identification and Listing of Hazardous Wastes
40 CFR 262	Standards Applicable to Generation of Hazardous Waste
40 CFR 263	Standards Applicable to Transporting of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 267	Interim Standards for Owners and Operators of New Hazardous Waste land Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	Hazardous Waste Permit Program
40 CFR 300.415	National Oil Hazardous Substance Pollution Contingency Plan, Removal Action
16 U.S. Code (USC), Section 469	National Historic Preservation Act
29 USC, Section 651-678	Occupational Safety and Health Act
33 USC, Section 1251-1376	Clean Water Act
42 USC, Section 7401-7642	Clean Air Act
42 USC, Section 300(f)	Safe Drinking Water Act
49 CFR, Parts 107, 171-177	Hazardous Materials Transportation Regulations
40 CFR, Part 6, Appendix A	Protections of Wetlands
40 CFR 257.3	Protection of Wetlands and Endangered Species

State of New Jersey

N.J.A.C-7:7A	Freshwater Wetlands Protection Act Rules
N.J.A.C-7:9	Water Pollution Controls
N.J.A.C-7:9B	Surface Water Quality Standards
N.J.A.C-7:9C	Groundwater Quality Standards
N.J.A.C-7:14	Water Pollution Control Act
N.J.A.C-7:16	Worker and Community Right to Know Regulations
N.J.A.C-7-18	Regulations Governing the Certification of Laboratories and Environmental Measures
N.J.A.C-7:26	Solid Waste
N.J.A.C-7:26E	Technical Requirements for Site Remediation
N.J.A.C-7:26G	Hazardous Waste

7. Methods to Evaluate Compliance with Acceptability Criteria

As described in Section 5.0 of this CQCP, all documentation and memorandums will undergo a thorough multi-level QC review. Each document will first be reviewed by the Task Lead/Quality Control Inspector followed by review by the appropriate Project Quality Assurance Manager/Senior Technical Support person and the project manager.

A Preparatory inspection followed by two inspections during the field activities will be scheduled in advance of initiating the field activities, and be conducted by the Task Leads/Quality Control Inspectors. The preparatory and follow-up inspections will be attended by the project manager and may be attended by an USEPA 2 representative. The Task Leads/Quality Control Inspectors will inspect the daily field forms and data results relevant to their specific task to ensure that acceptability criteria have been achieved. The Task Leads/Quality Control Inspectors will perform a final inspection at the completion of the field activities to ensure that the overall objectives of the RI have been completed. The results of the inspections will be documented in memorandums and forwarded to USEPA 2.

8. Nonconformances and Corrective Actions

If acceptability criteria are not achieved, the Project Manager will direct the project team or the responsible subcontractor to repair the item and/or redo the work in order to comply with the acceptability criteria. This may include, but is not limited to: re-sampling, re-testing or creating additional delineation points in order to bring the nonconforming condition into compliance. Re-sampling would be required if the samples were collected from the wrong location or sample depth or if the samples were improperly handled, labeled, or packed (for example, high temperature upon receipt at the laboratory or failure to maintain the samples at the temperatures prescribed in the SAP). Re-analysis of the sample(s) would be required if the acceptance criteria and procedures presented in the SAP required this action.

8.1 Nonconformance Reporting

Nonconformance reports (NCRs) will be issued by the CQCM/RTL for items or activities not meeting the acceptable criteria presented in Chapter 6.0 of this plan. Deficiency Notices issued by the USEPA 2 will also result in the preparation of an NCR by the CQCM/RTL. Nonconformance reports are used to document noncompliances (failure to meet the acceptability criteria) encountered during the normal course of conducting work or found during inspections. In the course of conducting some activities, it may not be possible to attain the specified acceptance criteria due to the encountered site conditions. An example of such a situation is not attaining the 10 foot depth in the test trenches in the landfill due to the type of encountered debris in the landfill and slope stability issues. While this represents a deviation from the acceptance criteria, a corrective action to correct the situation is not possible. Nonconformance reports will not be issued for such situations. In other cases, the nonconformance may be due to the failure by the project team to follow the established procedures. An example of such a situation is noting improperly completed Forms II Lite paperwork during a QC inspection. An NCR issued for this situation will require a corrective action (for example, the Task Lead/QC Inspector to review the requirements with the field person who made the mistake).

A NCR will, at a minimum, include the following:

- Detailed description of the nonconforming item or activity
- Cause of nonconformance
- Referenced criteria
- Recommended disposition ion/corrective action
- Disposition and verification corrective action
- Affected organization or subcontractor

8.2 Nonconformance Disposition

Nonconformance reports will be immediately issued to the CH2M HILL PM and the responsible organization/group for disposition. Dispositions of NCRs will require the responsible organization/group to identify the cause, corrective action, action to preclude recurrence and the date when all corrective actions will be completed. Corrective actions will be approved by the CQCM/RTL and the CH2M HILL PM prior to implementation. Nonconformance reports will remain on open status until the corrective actions have been implemented and verified as acceptable by the CQCM/RTL and PM.

8.3 Consequences of Failure to Implement Quality Control

A lapse in the implementation of this CQCP plan could have a detrimental effect on the overall end products. Failure to achieve the proper level of QC could have negative effects at all levels of the project or across the project as a whole. Failures to implement QC actions will be reviewed to determine the cause of the failure, potential impacts to project, appropriate corrective actions, and potential impacts to the budget, schedule and the ability to meet the project acceptability criteria and goals. Deficiencies in QC implementation will be handled as a nonconformance as described above. The CQCM/RTL will immediately notify the CH2M HILL PM of any QC implementation failures. The CH2M HILL PM will inform the USEPA 2 PM of any QC failure. CH2M HILL will directly implement immediate corrective actions to prevent recurrence of the QC failure.

9. Procedural Reviews

Standard Operating Procedures were developed fort the Phase 1 activities and revised to incorporate the procedures and requirements (criteria and documentation) for the Phase 2 activities. New procedures were also developed. These procedures and the associated project-specific forms/checklists will be utilized to record information which will be used to assess whether conformance criteria have been achieved. The SOPs and forms can be found in the various planning documents and are not repeated here.

10. Documentation and Reporting

CH2M HILL will prepare and submit monthly reports to the USEPA 2 and USACE. The reports will briefly summarize the month's activities by task and discuss work progress, anticipated problems and solutions, deliverables, upcoming events, and financial status. The reports will be accompanied by a monthly invoice and discussion of the project schedule. The reports will also include discussion of any nonconformance (whether correctable or not).

All documentation related to the QC process and project execution will be maintained in the project record file system. Project files for the Site will be maintained in CH2M HILL's, Parsippany, New Jersey office.

The project files will be subject to an office audit by the CQCM/RTL or his designee and the audit report will be maintained in the project file.

If, during the course of field activities, it becomes necessary to request approval for a variance from the approved plans, a request will be made, where possible, prior to encountering the necessity to do so in the field for a variance. Written requests for a Field Work Variance will be submitted to the USEPA 2 prior to implementation.

11. References:

CH2M HILL, 2007b. *Phase 2 Focused Remedial Investigation/Feasibility Study Health and Safety Plan for the Diamond Head Oil Superfund Site.* Region 2, Kearny, NJ. August 2007

CH2M HILL, 2007b. *Phase 2 Focused Remedial Investigation/Feasibility Study Sampling and Analysis Plan for the Diamond Head Oil Superfund Site.* Region 2, Kearny, NJ. August 2007

CH2M HILL, 2007b. *Phase 2 Focused Remedial Investigation/Feasibility Study Site Management Plan (Attachment A of the SAP) for the Diamond Head Oil Superfund Site.* Region 2, Kearny, NJ. August 2007.

CH2M HILL, 2007b. *Phase 2 Focused Remedial Investigation/Feasibility Uniform Federal Policy – Quality Assurance Project Plan for the Diamond Head Oil Superfund Site.* Region 2, Kearny, NJ. August 2007.

Attachments

CH2M HILL STATEMENT OF TECHNICAL REVIEW
Diamond Head Oil Superfund Site, Kearny, New Jersey

Document name:

CH2M HILL has completed the technical quality review of the submittal of the above deliverable for the Diamond Head Oil Superfund Site, Kearny, New Jersey. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures and material used in analyses; the appropriateness of data used and level of data obtained; and reasonableness of the results including whether the product meets the customer's needs .

Document Preparer:	Signature:	Date:
Task Lead	Signature:	Date:

Project Manager		**CH2M HILL Technical Review**	
Signature	Date	Signature	Date

CH2M HILL STATEMENT OF SIGNIFICANT COMMENTS
Diamond Head Oil Superfund Site, Kearny, New Jersey

Document Name:

Significant concerns expressed by the CH2M HILL review and the explanations of the resolution are as follows.

Comments:

CH2M HILL STATEMENT OF TECHNICAL REVIEW COMPLETION
Diamond Head Oil Superfund Site, Kearny, New Jersey

Document Name:

_____

_____

Verification/Acknowledgment

This is to certify that the CH2M HILL Project Team and Quality Control Team have met and reviewed the attached comments generated during the technical review of this document for the **Diamond Head Oil Superfund Site**, Kearny, New Jersey. All comments resulting from the CH2M HILL review have been resolved and incorporated. (Exceptions to be noted on attached pages.)

Document Preparer (print):

Signature: _____ Date: _____

Task Lead (print):

Signature: _____ Date: _____

Juliana Hess
Project Manager

Signature: _____ Date: _____

Tables

Table 2-1
Project Milestone
Diamond Head Oil Superfund Site

Anticipated Date(s) of Initiation	Anticipated Date of Completion	Activities
Pre-remedial investigation planning		
7/52007	7/24/2007	Submit figure of proposed temporary road locations and delineated wetlands to USEPA 2
7/5/2007	7/27/2007	Submit revised trench layout based on review of the historic aerial photographs for the site
7/5/2007	8/17/2007	Submit Draft technology screening memo
6/29/2007	8/29/2007	Submit Phase 2 Focused RI Planning Documents (UFP-QAPP, CQCP, SAP, HSP, SMP)
9/28/2007	10/26/2007	USEPA 2 review of Phase 2 Focused RI Planning Documents CH2M HILL address USEPA 2 comments
8/29/2007	11/5/2007	Procure subcontractors
Focused Remedial Investigation		
11/5/2007	12/3/2007	Mobilize field facilities, equipment, and supplies
12/3/2007	12/10/2007	Complete vegetation clearance
12/10/2007	12/24/2007	Complete construction of temporary roadways
1/2/2008	1/16/2008	Complete landfill investigation
1/16/2008	1/23/2008	Construct air/bio sparge test trench
1/23/2008	2/21/2008	Complete LIF investigation
2/21/2008	2/28/2007	Complete LNAPL recovery pilot test
02/28/2008	3/6/2008	Complete air/bio sparge pilot test
Remedial Investigation Reporting and Feasibility Evaluation of Appropriate Remedial Alternatives		
Upon receipt of data	Eight weeks following receipt of data	Prepare a Technical Memorandum presenting the results of the focused Phase 2 investigation
Upon Completion of TM	Eight weeks after submitting Phase 2 TM	Prepare a Focused Feasibility Study Report
** Schedule accounts for holiday downtime*		
**Project schedule assumes complete funding of project*		

TABLE 3-1
Project Team Members, Disciplines, and Project Roles
Diamond Head Oil Superfund Site

Member	Project Roles	Office Location	Phone Number
Mark Lucas, P.G.	Contractor Quality Control Manager/Review Team Lead	Philadelphia, PA	(215) 640-9045
Juliana Hess, P.E.	Project Manager	Parsippany, NJ	(973) 316-0159 ext. 4550
Mark Lucas, P.G.	RI Quality Assurance Manager/Senior Technical Support	Philadelphia, PA	(215) 640-9045
Tom Palaia, P.E.	FS Quality Assurance Manager/Senior Technical Support	Denver, CO	(303) 717-2495
Kevin Flynn	ConstructionQuality Assurance Manager/Senior Technical Support	Parsippany, NJ	(973)-316-9300 ext. 4557
Heather Hodach	Project Chemist	Milwaukee, WI	(414)-272-2426 ext. 40428
Priya Jain	Compliance	Parsippany, NJ	(973-316-9300) ext. 4583
Matt Germon, P.E.	Feasibility Study Lead/QC Inspector	Boston, MA	(802) 453-5754
Andy Judd	Remedial Investigation Lead/QC Inspector	Parsippany, NJ	(973)-316-9300 ext. 4540
Steve Beck	Regional Health and Safety Coordinator	Milwaukee, WI	(414) 272-1052
Dave Reamer	Field Team Leader	Parsippany, NJ	(973) 316-0159 ext. 4520
Steve Hoffmann	Field Team Member	Parsippany, NJ	(973-316-9300) ext. 4514
Mike Murphy	Field Team Member	Parsippany, NJ	(973-316-9300) ext. 4541
Rachel Kopec	Field Team Member	Parsippany, NJ	(973-316-9300) ext. 4507
Delores Bellard-Bennett	CADD Specialist	Philadelphia, PA	(215) 640-9004
Angela Zelman	Administrative	Parsippany, NJ	(973-316-9300) ext. 4548

P.E. = Professional Engineer,
P.G. = Professional Geologist

Table 3-2
Responsibilities of Quality Control Personnel
Diamond Head Oil Superfund Site

Key Personnel	Role	Responsibilities
Juliana Hess	Project Manager	Overall responsibility for implementation of project and quality of deliverable end products. Communication with USEPA 2 regarding all field and reporting activities Assisting the PM in external reporting of QC results
Mark Lucas	Contractor Quality Control Manager/Review Team Lead	Implementation of the Contractor Quality Control Plan Identification and implementation of corrective actions Overall coordination of field QC Conducting QC inspections of field activities
Tom Palaia	FS Project Quality Assurance Manager/Senior Technical Support	Conducting and documenting technical reviews related to LNAPL investigation and remediation Technical guidance and consultation at critical stages of product development Implementing and/or recommending corrective actions to the project team regarding delivery QC
Mark Lucas	RI Quality Assurance Manager/Senior Technical Support	Conducting and documenting technical reviews of remedial investigation activities Technical guidance and consultation at critical stages of product development Implementing and/or recommending corrective actions to the project team regarding delivery QC
Kevin Flynn	Construction Quality Assurance Manager/Senior Technical Support	Conducting and documenting technical reviews of construction activities. Technical guidance and consultation on construction activities Implementing and/or recommending corrective actions to the project team regarding delivery QC
Matt Germon	Feasibility Study Lead/QC Inspector	Responsible for design and implementation of LNAPL Recovery and Air/Bio Sparge Pilot Tests and FFS Provides technical guidance and consultation so that proper quality controls and established requirements are met Conducting checks and reviews of field data and documentations and implementing recommended corrective actions Assisting the PM and CQCM in external reporting
Andy Judd	Remedial Investigation Lead/QC Inspector	Overall responsibility for overseeing and implementing all field activities Provides technical guidance and consultation so that proper quality controls and established requirements are met Conducting checks and reviews of field data and documentations and implementing recommended corrective actions Assisting the PM and CQCM in external reporting
Heather Hodach	Project Chemist	Conducting audit of subcontractor laboratories, if required Review of UFP-QAPP, laboratory SOPs and QA plans related to analytical services Data review and validation

Table 6-1
Objective, Standards, and Acceptance Criteria for Diamond Head Oil - Superfund Site
Kearny, Hudson County, NJ

Field Activity	Quality Objectives	Standards	Acceptability/Performance Criteria	Applicable Quality Documentation	Responsible Person	Quality Control Activity/Frequency
Mobilization	To ensure that all facilities, services, and equipment are properly in place and functioning.	•Phase 2 HSP •Phase 2 SMP	Project planning performed in accordance with specified standards including: •USEPA 2 approval to proceed •Project documents approved •Proper permits obtained •Analytical laboratories have been approved •Functioning equipment, facilities, and services	•QC Inspection Checklist •Documentation of activities in log book	Implementation: •FTL QC Review: •RI task lead/QC Inspector	Site inspection by RI task lead/QC Inspector prior to initiation of activities. Audit field activities as described in CQCP.
Health and Safety Implementation	To ensure that all site personnel, subcontractors, visitors and public are protected from physical harm and exposure. Ensure that all H&S equipment is in place and inspected as required by HSP.	•Phase 2 HSP •Phase 2 SMP	H&S equipment and supplies available onsite per HSP. All work performed in accordance with the site HSP	•QC inspection checklist •Construction pre-task checklist •Self-assessment checklist •Equipment calibration logs •Documentation of activities in log book	Implementation: •FTL •Field team QC Review: •RI task lead/QC Inspector •FS task lead/QC Inspector •Construction task lead/QC Inspector	Site inspection by RI task lead/QC Inspector prior to initiation of activities. Audit of field activities as described in CQCP including random document spot checks for quality by QC Inspector.
Vegetation Clearance, Roads, Test Trenches	Properly clear areas of vegetation and construct roads to support heavy equipment. Execute a landfill trenching and sampling program to confirm that the landfill is not a source of contamination. Construct air/bio sparge trench.	•Phase 2 Work Plan •Phase 2 SMP •Phase 2 QAPP •Phase 2 SAP •SOP X (Landfill Trenching and Waste Documentation) •SOP X (Road Construction Documentation) •SOP X (GPS Surveying) •SOP X (Transit Level and Stadia Rod Survey) •Sampling SOPs (Sample Nomenclature, Chain of Custody Procedures, Field Parameter Forms, Same Collection, Sample Packaging)	Vegetation clearance, temporary roadways, and test trench constructed to specified standards including: •Vegetation debris stored in designated location •Roadway dimensions •Construction material in accordance to specifications Landfill investigation completed to specified standards including: •Trenching depth and locations •Proper collection, preservation, identification, and handling of soil samples •Sufficient documentation of underlying material and landfill contents	•QC inspection checklist •Construction pre-task checklist •Task specific permits •Equipment calibration logs •Documentation of activities in log book •Test pit log •Correctly completed sample paperwork	Implementation: •FTL •Field team QC Review: •RI task lead/QC Inspector •Construction task lead/QC Inspector •Project chemist/QC Inspector	Site inspection by RI task lead/QC Inspector and Construction task lead/QC Inspector prior to initiation of activities. Audit of field activities as described in CQCP including random document spot checks for quality by QC Inspector.
LIF Delineation	Delineate the extent of LNAPL including residual and possible mobile phases. Collect representative soil samples to determine the extent of potentially mobile LNAPL. Estimate the order-of-magnitude mobility and recoverability of LNAPL.	•Phase 2 Work Plan •Phase 2 QAPP •Phase 2 SAP •SOP X (LIF Delineation and Soil Sampling) •SOP X (GPS Surveying) •SOP X (Transit Level and Stadia Rod Survey) •Sampling SOPs (Sample Nomenclature, Chain of Custody Procedures, Field Parameter Forms, Same Collection, Sample Packaging)	LNAPL Delineation conducted to specified standards including: • Proper calibration procedures • Proper decontamination of equipment • Proper sampling location • Delineation reporting and analysis • Accurate documentation of delineation point locations Collection of intact core samples completed to specified standards including: • Proper calibration procedures • Proper decontamination of equipment • Proper sampling location • Proper collection, preservation, identification, and handling of soil samples • Sample quantities/volume	•QC inspection checklist •Equipment calibration logs •Documentation of activities in log book •Daily LIF report •Soil boring log •Correctly completed sample paperwork	Implementation: •FTL •Field team QC Review: •RI task lead/QC Inspector •FS task lead/QC Inspector •Project chemist/QC Inspector	Site inspection by RI task lead/QC Inspector and FS task lead/QC Inspector prior to initiation of activities. Audit of field activities as described in CQCP including random document spot checks for quality by QC Inspector.
LNAPL Recoverability Testing	Collect groundwater and LNAPL samples to determine dynamic viscosity, fluid density, and surface tension for mobility and recoverability testing. Estimate the range of LNAPL transmissivity and recoverability. Provide a second line of evidence (in addition to laboratory LNAPL mobility evaluation) for predicting LNAPL recovery rates.	•Phase 2 Work Plan •Phase 2 QAPP •Phase 2 SAP •SOP X (LNAPL Recoverability Testing and Sampling) •Sampling SOPs (Sample Nomenclature, Chain of Custody Procedures, Field Parameter Forms, Same Collection, Sample Packaging)	Collection of groundwater/LNAPL samples conducted to specified standards including: • Proper calibration procedures • Proper decontamination of sampling equipment • Proper sampling location • Proper collection, preservation, identification, and handling of LNAPL samples • Sample quantities/volume LNAPL recoverability testing conducted to specified standards including: • Correct system operating procedures • Accurate LNAPL and water level measurements • Proper documentation of test results	•QC inspection checklist •Equipment calibration logs •Documentation of activities in log book •Daily LNAPL recovery test log •Correctly completed sample paperwork	Implementation: •FTL •Field team QC Review: •FS task lead/QC Inspector •Project chemist/QC Inspector	Site inspection by RI task lead/QC Inspector and FS task lead/QC Inspector prior to initiation of activities. Audit of field activities as described in CQCP including random document spot checks for quality by QC Inspector.
Air/Bio Sparge Testing	Develop information to be used during the FFS to evaluate the applicability of this technology for a full scale treatment system.	•Phase 2 Work Plan •Phase 2 QAPP •Phase 2 SAP •SOP X (Air/Bio Sparge Testing) •Sampling SOPs (Sample Nomenclature, Chain of Custody Procedures, Field Parameter Forms, Same Collection, Sample Packaging)	Air/Bio Sparge testing conducted to specified standards including: • Proper calibration procedures • Proper decontamination of sampling equipment • Daily calibration of water quality meters • Operated and monitored following standards Confirmation GW sampling to specified standards including: • Proper calibration procedures • Proper decontamination of sampling equipment • Proper purging and stabilization of water quality parameters • Proper collection, preservation, identification, and handling of GW samples • Sample quantities/volume	•QC inspection checklist •Equipment calibration logs •Documentation of activities in log book •GW low flow purge log •Air/Bio sparge monitoring daily log •Correctly completed sample paperwork	Implementation: •FTL •Field team QC Review: •FS task lead/QC Inspector •Project chemist/QC Inspector	Site inspection by RI task lead/QC Inspector and FS task lead/QC Inspector prior to initiation of activities. Audit of field activities as described in CQCP including random document spot checks for quality by QC Inspector.